

I claim:

1. A photovoltaic device for concentrating sunlight to multiple photo voltaic cells comprising:
a metallic bottom layer with a multiplicity of indentations, at least a plurality of indentations containing a
5 photo voltaic cell; and
a transparent top layer containing multiple optical devices, the top structure aligned to the bottom
structure such that the optical devices are positioned over at least one indentation in the metallic bottom
layer, wherein the optical devices concentrate incident sunlight towards each of the photovoltaic cell.
2. A system for locally concentrating sunlight onto a layer of multiple miniaturized photovoltaic cells that
10 can operate independently on a stand-alone basis, comprising:
a metallic bottom layer containing multiple bottom sections, wherein a majority of the multiple bottom
sections are concentrator sections that contain a photovoltaic cell, and a minority of the multiple bottom
sections are control sections;
a transparent top layer containing multiple top sections, each top section corresponds to a bottom section
15 in the metallic bottom layer, wherein each section of the top layer corresponding to one of the majority
bottom sections of the metallic bottom layer contains an optical device positioned over the metallic
bottom layer, with each of the optical devices concentrating the incident sunlight onto one of the
photovoltaic devices.
3. A miniaturized photovoltaic cell comprising means for confinement of hole-electron pairs to prevent
20 diffusion to an edge of a semiconductor material.